

ACETATE
ACRILAN
ARNEL
COTTON
CRESLAN
CUPRAMMONIUM
DACRON
DARLAN
DYNEL
FLAX
FIBERGLAS
FORTISAN
NYLON
ORLON
SARAN
SILK
WOOL
VISCOSE
VEREL

TODAY'S FABRICS: products of science

Vivian White

Cornell Extension Bulletin 972

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Within the past twenty years, science has done a great deal to make life easier for us. Great-grandmother would be impressed and bewildered by our new washing machines, clothes driers, detergents, sewing machines—and easy-care fabrics. Ironing may soon become a lost art. We have fewer socks to darn, and wash day is less strenuous.

Life is easier. But it is more confusing. While grandmother had only four textile fibers—wool, cotton, silk and flax—today's homemaker has in addition rayon, acetate, nylon, Orlon, Dacron, Arnel, Dynel, Acrlan, Vicara, Saran, and Fiberglas and an increasing number of others. Each of these fibers has some outstanding advantages: nylon is strong, wool is resilient, and Orlon is extremely resistant to sunlight. But each fiber also has distinct disadvantages for certain uses. None is a "miracle fiber." None is universally suitable for every purpose. Because we have so many choices, fabric selection is more difficult for us than it was for grandmother.

Cornell tests new fabrics

In our laboratories at Cornell, we are working with many fabrics used by homemakers to determine their serviceability, uses, and care. We have given them repeated washings and dry cleanings. We have measured their *shrinkage* and *wrinkle resistance*. We have determined their *fiber content* and the *amount of finish* present. We have experimented to see *whether or not you can durably pleat them at home*, and have tried to remove creases which have been pressed in. We have stitched them to see *what problems the home dressmaker might encounter*.

You too will need to test new fabrics

Since manufacturers are constantly changing and improving their fabrics, and since every fabric behaves somewhat differently, you will need to do a little experimenting yourself each time you buy something new. *The purpose of this bulletin is to tell how you might go about this, and to make some suggestions about the purchase, use, and care of some of today's fabrics, especially those made from blends and combinations of fibers.*

In order to become familiar with the common textile fibers, let's divide them into two groups, according to their absorbency:

GROUP 1	GROUP 2
Fibers which absorb water readily	Fibers which absorb little or no water
Wool	Acetate
Silk	Arnel
Flax	Darlan
Viscose rayon	Nylon
Cuprammonium rayon (Bemberg)	Acrlan
Fortisan rayon	Creslan
Vicara	Orlon
Cotton	Verel
	Dynel
	Dacron
	Saran
	Fiberglas

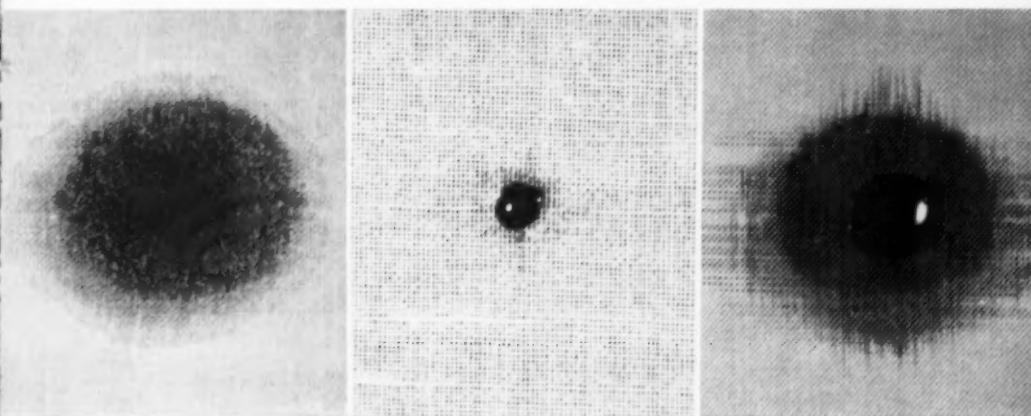
Arrows
indicate
increasing
absorbency

Fibers which absorb water readily (Group 1) are comfortable to wear and easy to dye. However, they tend to pick up water soluble stains.

Fibers which absorb little or no water (Group 2) are less comfortable to wear and harder to dye. They shed water soluble stains, but attract lint, and greasy-type soil. Because they absorb little water, they dry rapidly. They require little or no ironing and can often be pressed without dampening. They tend to accumulate static electricity.

1. Left: A water-soluble stain such as ink, when dropped on cotton (Group 1), is rapidly absorbed into the cotton fibers and spreads over a large area. Center: But an ink drop on nylon (Group 2), stands on the surface and takes a long time to be absorbed. Right: Dacron (Group 2), is another fiber which does not absorb moisture readily. However, it does exhibit "wicking" tendencies. That is, although the ink stands on the surface and does not penetrate the Dacron fibers, the yarns in the cloth act as wicks and transport the moisture. This makes Dacron somewhat more comfortable to wear than nylon, because body perspiration is carried in the same way as the ink in the illustration.

NOTE: Wicking is not always an advantage. If you are caught in a rain storm in a Dacron suit, you will be wet to the skin within minutes, or if you spill a beverage on an Orlon dress the liquid can be carried rapidly to your underclothing.



Some common questions about fibers

Q. Which fibers make fabrics that are comfortable to wear if it is hot, or if I perspire a great deal?

A. Fibers in Group 1 (p. 3): wool, silk, flax, rayon, Vicara, and cotton are the most comfortable. The way the yarns and cloth are made is equally important. Comfort is improved when the weave is loose or open to allow air to circulate. Smooth fabrics are cooler than fuzzy ones.

Fibers in Group 2 (p. 3) such as acetate, Arnel, nylon, Orlon, Acrilan, Dynel, and Dacron, sometimes feel clammy because they do not absorb body perspiration. Dacron and Orlon fabrics because of their "wicking" characteristics, (see figure 1) are sometimes more comfortable than nylon materials.

Q. Which fibers make fabrics that are warm for winter clothing or for blankets?

A. Wool, Orlon, Acrilan, Creslan, Darlan, Verel, Dynel, and nylon all have been used for thick bulky fabrics having dead air spaces which help to keep body heat from escaping. These fibers are resilient and the cloth will tend to spring back to its original thickness and keep its warmth after washing. However, the synthetics, especially Dynel, are sensitive to heat and may mat down if subjected to steam cleaning or if tumble dried in a hot dryer. Brushing will not help when this happens. Cotton and rayon blankets can be just as warm as those made from other fibers, but with repeated launderings they tend to lose their fluffiness together with some of the air spaces

which are so important for warmth. A different kind of cloth is necessary to keep the wind out. A wind-resistant fabric must be very closely woven. Usually cotton, silk, nylon and rayon or other man-made fibers in firm close weaves are used for this purpose.



2. The Dacron blouse pictured, pressed with the iron set for rayon (approx. 325-350F.), shows shrinkage due to heat. This blouse has not been properly "heat set" by the manufacturer.

Q. Which fibers are likely to melt when I iron them?

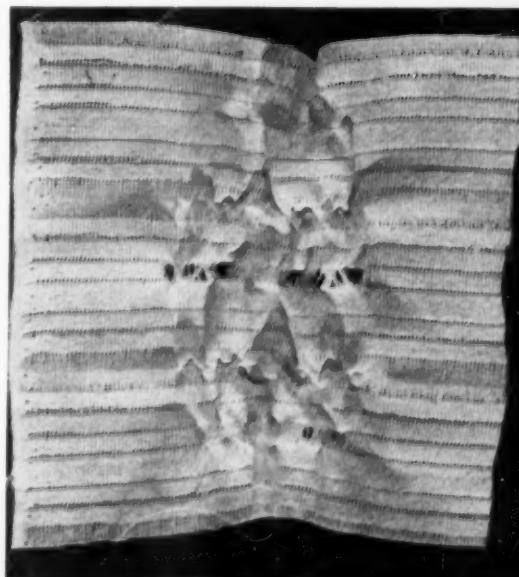
A. The fibers in Group 2 (p. 3) such as acetate, Arnel, nylon, Orlon, Acrilan, Dynel, Dacron, and Saran are likely to melt. Fiberglas is an exception. It can withstand tremendous heat but needs no ironing.

The effect of heat on the fibers in Group 2 (p. 3) is shown in the table below:

Saran	Shrinks at 160°-250° F. (Water boils at 212° F.) Softens at 240°-280° F.
Dynel	Shrinks at temperatures above 240° F. Melts at 240°-300° F. (See figure 3 below)
Acetate	Loses strength, shines at 194°-250° F. Softens at 397°-406° F.
Orlon	Sticks at 455°-480° F.
Acrilan	Softens at 464° F.
Nylon	Sticks at 455° F. Melts at 480° F.
Dacron	Sticks at 455° F. Melts at 480° F.
Arnel	Sticks at 482° F. Melts at 572° F.
Fiberglas	Melts at 1540° F.

Long before these fibers melt, they may shrink and shine (see figure 2) so all should be pressed carefully with the iron set for "synthetics" or "low rayon" (250° to 300° F.). Dynel and Saran are particularly sensitive (see figure 3). Saran curtains should not be ironed. Fabrics containing Dynel (e.g. Fabric No. 8, p. 18) should be protected by a damp press cloth and pressed with extreme caution.

3. This multifiber fabric (each stripe is a different fiber) was pressed with the iron set for synthetics (250-300F.). It shows shrinkage and melting of the Dynel stripes. Fabrics containing Dynel should be protected by a press cloth even when the iron is set at low heat.



Q. On which fibers is it safe to use a bleach?

A. There are many types of bleaches on the market. They may be divided into two groups: 1) Those which are safe for use on all types of fibers and 2) Chlorine bleaches which should not be used on wool, silk, or Vicara. These recommendations are for white fabrics. For colored materials, test bleach first on an inside seam to see whether or not it will remove the color.

White cotton and rayon can be bleached with chlorine bleaches provided they do not have a resin finish. Often used for crispness, wrinkle resistance, lustre, or embossed effects, these finishes retain chlorine with the result that the fabric turns yellow or is weakened.

For these materials you should use one of the other bleaches, e.g., one containing sodium perborate or one of the color removers sold with home dyes. These are good for taking out discolorations and stains from all kinds of white fabrics. Recently, a number of special products have come on the market for bleaching synthetics, silk, and wool. The principle ingredient may be sodium perborate, or a color stripper such as sodium hydrosulphite. These products may also contain an "optical dye." This is a dye which picks up ultra violet light and reflects it so that we see it as visible light, making both colored and white fabrics look brighter.

NOTE: Material which has yellowed after being treated with a chlorine bleach may sometimes be restored to whiteness by soaking in a solution of sodium thiosulfate, one teaspoon to one quart of hot water. Soak until yellow color disappears. Rinse thoroughly. This chemical can be obtained at a drug store or from a photographer's supply house.

4. Which bleach shall I use? The packages shown are common bleaches available to the homemaker.

Group 1: These bleaches can be used on all types of fibers. (a) sodium perborate type, (b) commercial color remover, (c) special products for nylon and other synthetics, wool, and silk.

Group 2: Chlorine bleaches (a) liquid, (b) powder.



Q. Which fibers dye most readily?

Are some fibers more colorfast than others?

A. Fibers in Group 2 (p. 3) are difficult to dye because of their low absorbency. When you dye them at home, don't expect the color to match that on the color card or package. Some will take little or no dye. Fiberglas does not absorb dye and must be printed in the mill with colored pigments which are bonded to the surface by a special treatment. Research workers are constantly trying to find better ways of dyeing such fibers as nylon, Orlon, Dacron, Dynel, and Arnel. One method of coloring now being used by manufacturers of man-made fibers is called *solution dyeing*. Pigments are ground up and put right into the solution from which the fiber is spun. In this way, the color is right in the fiber and cannot be washed out, or harmed by atmospheric gases such as coal gas or other gases common in industrial areas. *Chromspun* and *Celaperm* are trade names for acetate colored in this way. *Jetspun* and *Coloray* are examples of "solution dyed" rayons.

Colorfastness depends not only on the kind of fiber but also on how you treat it and the type of dye used. Sunlight, atmospheric gases, acids, alkalies, perspiration, heavy duty laundry soaps, and detergents, bleaches, chlorine in swimming pools, salt water, hot water (160° F. and above), long agitation during the wash cycle, are all factors which may harm colored fabrics and should be avoided when possible. If you know that your garment must be subjected to one or more of these things, then it is important to look for a specific guarantee on the label, such as "sun fast," or "tub fast."

Dyes differ in their resistance to the factors listed above. Some can withstand chlorine very well. Some are colorfast to light but not to washing. Some are not harmed by alkalies or strong detergents. Some are "tubfast" but fade on exposure to sunlight. "Vat dyes," especially when used on cotton and linen, are excellent for all purposes, though even with vat dyes, some colors are better than others. Dyes sold for home use will dissolve in water and will always run when washed.

Q. Which fibers are most resistant to wrinkling and massing?

A. Wool and Dacron show excellent ability to recover from wrinkles. Dacron retains this characteristic even when wet. Silk, Orlon, Acrilan, Dynel, acetate, and Arnel are good. Cottons, rayons, and linens are poor in this respect unless they are treated with special finishes in order to make them wrinkle resistant. However, wrinkle resistance cannot be judged by the fiber or finish alone. The texture of the material and the way the cloth is made are factors. Crepe or knitted constructions, loose porous weaves, fuzzy, textured, and printed surfaces, all help to shed or to conceal wrinkles.

Q. Which fibers are most resistant to sunlight?

A. "Fiberglas" is not affected by sunlight. "Orlon" has very high resistance. Dacron and Dynel show good resistance. Saran darkens somewhat. Wool, cotton, rayon, linen, acetate, nylon and silk fabrics lose strength after prolonged exposure.

Q. Do some fibers shrink or stretch more than others?

A. "Fiberglas" is one of the few fibers which doesn't shrink. Fabrics made from nylon, Orlon, Dacron, Dynel, and other fibers in Group 2, p. 3, usually keep their shape very well during washing and dry cleaning. However, these fibers are sensitive to heat. Occasionally an Orlon sweater will stretch during laundering, or a Dacron blouse may shrink when pressed as shown in figure 2, p. 3. This is because the temperatures you used during washing, drying, and pressing were higher than those used to "heat set" the fabric or garment when it was manufactured. An improperly heat set article may also become permanently wrinkled if subjected to heat in washing or drying.

Absorbent fibers (Group 2, p. 3) are sensitive to moisture as well as to heat. Fabrics made from these fibers need to be given special finishes to control shrinkage. Changes in humidity in the atmosphere may cause them to shrink and stretch alternately. This is sometimes noticeable in draperies. Fabrics made from such fibers as cotton, wool, and rayon tend to shrink with washing or steam pressing. Vigorous agitation and long washing periods, or over-drying in an automatic dryer, may increase the rate of shrinkage. Finishes for shrinkage control are being improved and some manufacturers now guarantee their goods to be "unconditionally washable." Causes for shrinkage of wool are so numerous that washable woolens cannot be guaranteed even when they have been given a finish. They should always be treated gently during washing. When you purchase yard goods or ready-made articles, it is very important to *save and follow any directions* for care given by the manufacturer.

Q. Which fibers are the strongest?

A. Nylon is at the top of the list along with Fortisan, a kind of high-strength rayon. Dacron, Saran, linen, silk, and cotton are also very strong.

Q. Which are the weakest?

A. Rayon, acetate, Vicara, and wool lose considerable strength when wet and should be handled carefully in washing. "Fiberglas" has adequate strength, but low resistance to rubbing or abrasion. Therefore, "Fiberglas" draperies should not be drawn back and forth on traverse rods and should clear the floor.

Q. What can I expect from a fabric made from two or more kinds of fibers?

A. It will behave somewhat like each fiber that is present. When fibers such as Orlon, Dacron (Group 2) are added to cotton, or rayon (Group 1), they will increase the speed of drying, and if the proportion used is high enough, very little moisture will be needed in pressing. Fibers from Groups 1 and 2 (p. 3) tend to complement each other when blended or combined together. To help retain the washability, quick drying, wrinkle resistance, and easy care features of Orlon and Dacron, there should usually be at least 55 percent of these fibers in mixtures with wool, and 65 percent or more when they are combined with cotton or rayon.

The outstanding characteristics of each kind of fiber should also be considered; e.g. Dacron will make a special contribution to the wrinkle resistance of a cotton or rayon blend. Nylon and silk give added strength and luster. Dacron, Orlon, Acrilan, and Arnel blended with rayon or cotton in the proper amounts produce fabrics in which the homemaker can readily press pleats which are durable to laundering. Much research is being done on the proper methods of mixing fibers together in order to balance advantages and disadvantages of the various fibers.

In caring for these materials, you must consider each fiber that is present. For example, a Dynel-wool blend must be washed gently because the wool may shrink, and pressed with extreme care to prevent shrinkage of the Dynel. (See figure 3, p. 5). A cotton and acetate mixture cannot be pressed at cotton temperatures because the acetate may shrink, shine and melt (see figure 5).

A *blend* is made by mixing two or more kinds of fibers together before the yarns are spun. This thorough mixing makes it hard for the consumer to identify the fibers. It is becoming more and more necessary for her to rely on labels for information about fiber content. There are many other ways of combining fibers in a fabric. A *combination* may be made by having lengthwise yarns (warp) of one fiber and crosswise yarns (filling) of another. See fabrics pictured on pp. 16 and 17.

5. Acetate cotton combination pressed with the iron set for "cotton" (approx. 450F.) shows shrinkage of acetate yarns.



Suggestions for the purchase, use and care of fabrics containing blends and combinations of fibers

When you buy material by the yard

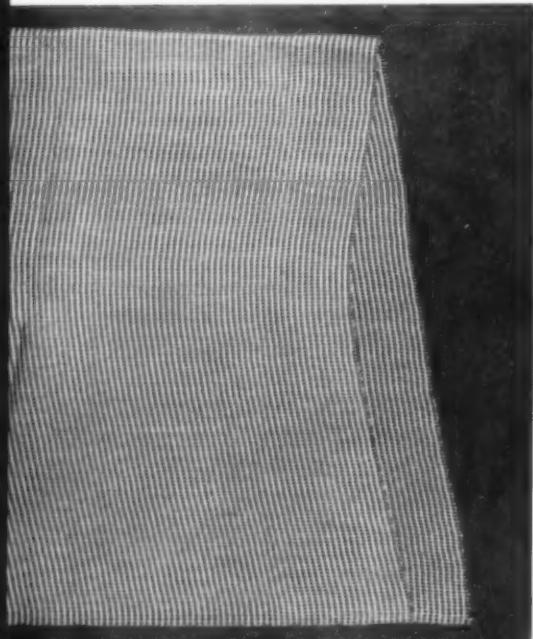
1. Be sure it hasn't been stretched out of shape. The Orlon-nylon combination in figure 6 could not be straightened because it had been heat set in this form. The 70 percent wool and 30 percent Dynel flannel (fabric no. 8, p. 18) and the rayon-Orlon tweed (fabric no. 9, p. 18) were also very distorted and attempts to straighten them were only partially successful. Garments or drapes made from distorted materials will not hang well, and it is impossible to follow the grain of the material when you cut. (See figure 6).

2. Consult your pattern for the amount of material needed. Many of the new fabrics are woven 45 inches, 54 inches, and 60 inches—a consideration when you are estimating the cost. These widths make for economical cutting, often saving material.

3. Consider the style of the garment. You should hold up each new material and note whether or not it hangs in soft folds or pokes out stiffly. Will it create the effect you wish? The blends and combinations tested all had body and crispness and took sharp pleats. None was suitable for soft, clinging or draped effects.

4. Do you wish to have pleats which will last through washing? You can put durable pleats in Dacron, Orlon, Acrilan, and Arnel materials by using an iron and a damp cloth. Nylon fabrics pleat readily but in order to make the

pleats durable to washing the pressing temperature must be very close to the melting point of nylon. Though it is done successfully by manufacturers, the homemaker may have difficulty in keeping the material from melting and shining.



6. This is an Orlon and nylon fabric as it was purchased. It is extremely crooked, has been stretched and "heat set" by manufacturer, and cannot be straightened.

5. Choose suitable linings and interfacing. For a washable, quick drying garment it is usually best to choose a washable quick drying lining or interfacing. A cotton crinoline lining in a Dacron and cotton dress would lessen the easy care characteristics. It would be better to have the crinoline separate from the dress. An Orlon lining, though it would be easy to wash, would make an Orlon and cotton suit uncomfortably warm for wearing in summer. You may have to choose between comfort and washability—or omit the lining altogether.

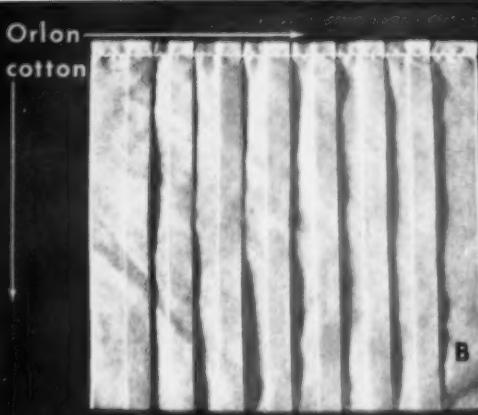
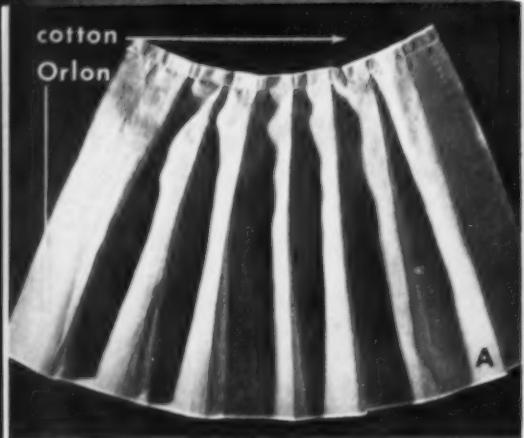
When you cut

1. Pre-shrink your material. Results of shrinkage measurements showed that many of these materials need pre-shrinking before being made into garments. Although the greatest shrinkage was with washing, several showed an undesirable amount of shrinkage in dry cleaning. This was probably due to the heat used by the dry cleaner in the tumbling and steam pressing processes. However, the dry cleaner cannot always be held responsible because the manufacturer may have neglected to "heat set" properly the synthetic fibers used in the blend.

Three per cent lengthwise shrinkage in a suit would make the sleeve more than one-half inch shorter. Therefore, it is wise to test your fabric before cutting. To do this, cut a small square from the fabric and a small piece of paper the same size. Wash and press the fabric sample. Compare with the square of paper to see if there has been noticeable shrinkage. Also note changes in color or stiffness. If the sample has lost its "new look," you may decide to gamble and omit the pre-shrinking process for the sake of the initial appearance of the garment. Fabric no. 10, p. 19, was one which was a poor buy because of this difficulty. Usually, however, if your small sample shrinks at all, you had better pre-shrink the whole piece.

If you plan to wash the garment, straighten the ends of the material by pulling threads, then pinning ends even. Thoroughly wet the fabric, avoiding wrinkles as much as possible. Hang smoothly with ends even and allow to drip dry. Steam press. If you are making something which will be dry cleaned, have the dry cleaner steam-press your material for you. The advantage of this is that he gives the material the same treatment the garment will receive in use. Be sure to tell him which fibers are present and ask him to keep the ends even during pressing so the fabric will not be distorted.

2. Lay your pattern correctly for durable pleats. Be sure that the fiber from Group 2, p. 3 such as Orlon, Dacron, Acrilan, Dynel or Arnel runs *across* the pleat. (See page 12). The best way to test for pleats is to try pressing lengthwise, crosswise, and bias creases in small swatches of the material. Then dip the samples in water and see in which direction creases are best retained. It



7. This Orlon and cotton combination shows pleats pressed lengthwise (a) and crosswise (b) with a steam iron. These samples were laundered five times without pressing. Lengthwise pleats (a) were lost when laundered because only cotton yarns were creased. Crosswise pleats (b) were durable because, in this case, creases were pressed into the Orlon yarns.

may be necessary to place your pattern crosswise on the material. If you do this, be sure to cut all the pieces crosswise or they may appear to be two different colors. A pleated skirt in which the pleats are on the bias will hang more softly than one in which the pleats are on the grain of the material. However, if the Group 2 fiber such as Orlon, Dacron, or Dynel is only in one direction of the cloth (as in fabrics 2, 3, 4, p. 16), bias pleats will not be durable. On the other hand, in the Orlon and wool skirt in figure 8 the bias pleats have held nicely because there was enough Orlon running in both lengthwise and crosswise directions to retain the creases.

3. Allow for wide seams. Many of the fabrics tested showed a good deal of fraying. (See fabrics pp. 16-19). Another reason for a generous seam allowance is that fabrics containing fibers in Group 2 (p. 3) such as Orlon and Dacron often do not have much "give" so you may need to allow for more ease.



8. This Orlon and wool skirt was washed five times without pressing.

When you sew

1. Finish raw edges securely with machine stitching. Most of the fabrics tested showed some tendency to fray. Pinking is not an adequate finish. Three suggestions for seam finishes are shown in figure 9.

2. Mercerized cotton, silk, nylon, and Dacron threads were tried on all these materials and no difficulties were encountered. It was necessary with some fabrics to loosen the tensions especially when using threads other than cotton. You will need to experiment with your own machine, thread, and fabric, since each material is different.

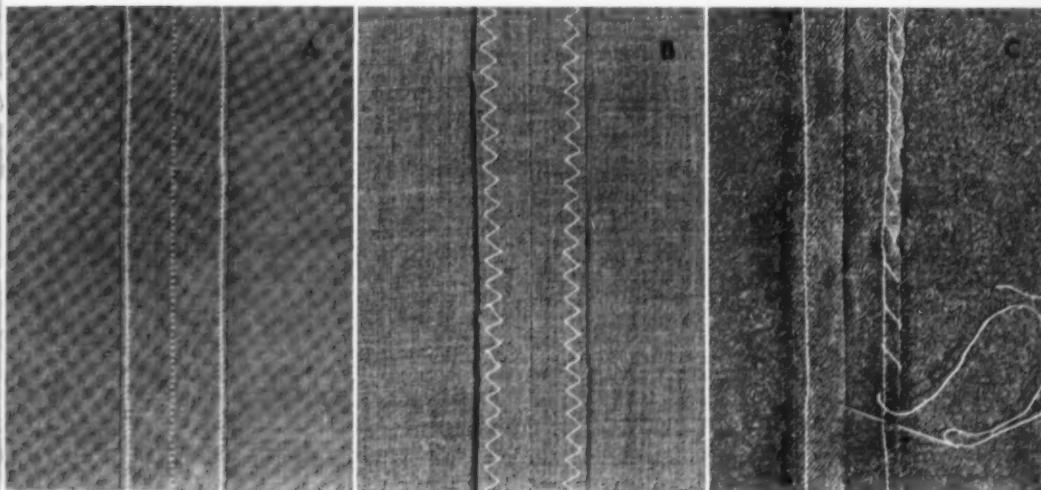
If you do have trouble with puckering, try the following: (1) a fine needle (No. 9 or 11); (b) very long stitches (8 to 10 per inch); or (3) very short stitches (20 to 30 per inch); (4) loose tensions; (5) mercerized cotton thread. Cotton thread is less likely to produce puckering but it is not so strong as the others and may wear out before the garment does, requiring occasional restitching. Another way to prevent puckering is to paste a piece of paper over the hole in the throat-plate of the sewing machine.

9. These seam finishes are suitable for fabrics containing blends or combinations of fibers:

(a) edges turned and machine stitched. This is not suitable for bulky fabrics such as No.'s 5,6,7,8,10,11, and 12, pp. 17-19. It is a good finish for fabrics No. 1-4, pp. 16-17 and 9, p. 18.

(b) edges finished with zig-zag stitch. If your machine does not make this stitch, you can buy a special attachment to use on a regular sewing machine. This method is suitable for all the blends and combinations shown pp. 16-19, and is especially useful for bulky fabrics.

(c) edges finished with one row of machine stitching. This is suitable for bulky materials, but if they fray badly, (e. g., fabrics No. 5 and 6, p. 17, and No. 10, p. 19) it may be desirable to overcast by hand.



When you press

All of the fabrics tested looked better after some pressing. However, most could be classed as "easy ironing," requiring only a small amount of moisture and a low temperature to remove the wrinkles. For all except the Orlon and silk shantung (fabric no. 1, p. 16), a light pressing on the wrong side with a steam iron was sufficient. The shantung needed more moisture than was given by the steam iron.

1. Use some moisture. Use a steam iron or dampen fabrics lightly. On blends containing Dynel always keep a damp press cloth between fabric and iron even when you use a steam iron since Dynel is unusually sensitive to heat.

2. Use a low iron setting to avoid damage. (See table showing effect of heat, p. 5.)

3. Test your iron. Since many irons do not heat evenly, it is a good idea to test yours by placing it on a sheet of white paper. If it has an uneven scorch pattern, you will need to use a lower setting. Then try it out on inconspicuous part of the garment, not in center front, as was done on the Dacron blouse in figure 2, p. 4.

4. Move quickly. Temperatures build up when you hold the iron in one spot.

5. Be careful not to press in unwanted creases. Sometimes they are hard to remove.

6. When pressing on the right side, use a press cloth between the iron and the garment. To avoid shine, use a dry wool cloth topped by a damp cotton one. If you have a steam iron, only the dry wool cloth is necessary. Strips of cardboard may be slipped between pleats to avoid marks such as those shown in figure 7, p. 12.

7. Stop pressing while the steam is still rising, before the cloth is completely dry. Pleats may be given a sharp edge by pounding with a tailor's spanker or the flat back of a clothes brush.

When you buy garments made from fabrics where two or more fibers are combined or blended

Note the following:

1. Does the label refer to the garment, or to the fabric alone? For example, a child's coat carried a label saying "This fabric is guaranteed unconditionally washable." But the coat itself had colored trim and padding and interfacing which could not be washed.

2. Does the label give directions for care? If the label says "washable," do not assume that it can be dry cleaned. If it says "hand washable," perhaps it shouldn't be washed in your washing machine.

3. Does the label tell you the fiber content? Use the back cover of this bulletin to find information on common textile fibers and how they behave in fabrics for various uses.

4. Are seams and raw edges firmly finished with adequate allowances for fraying or alterations?

In these days of new fibers, fabrics, and finishes, we can help to keep manufacturers informed regarding the success or failure of their products. The best way to do this is to go to the buyer in the store where the article was purchased. A reputable store will welcome legitimate complaints and will relay them to the manufacturer.

This will save us all money in the long run—manufacturer, retailer, and consumer. But it places a great responsibility on us as consumers. We must read, save, and use labels. We must learn how to use and care for new fabrics. We must be honest, prompt, and courteous in our criticisms, and we must have a sympathetic understanding of the difficulties facing manufacturers, retailers, and laundering and dry cleaning industries in their efforts to cope with these new products of science.

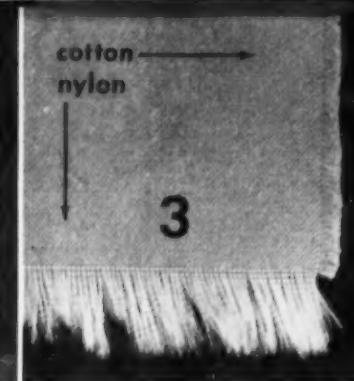
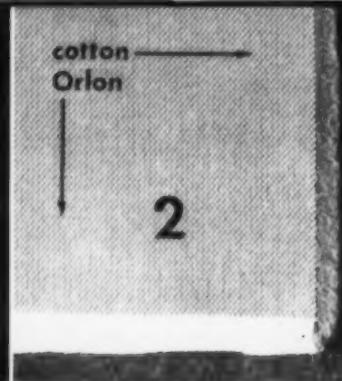
Twelve fabric blends and combinations tested at Cornell.

The swatches pictured on pp. 16 to 19 are taken from fabrics tested at Cornell. Notice the amount of fraying which occurred after ten launderings. These fabrics all contain two or more kinds of fibers blended or combined.

To determine shrinkage to laundering, 12 inch square samples of each fabric were washed for 5 minutes in an agitator type washing machine at 105°F. using mild soap flakes and a non-precipitating type of water softener. After two three-minute rinses they were spun for one minute to remove excess water and hung on rack to drip dry. Excess wrinkles were smoothed with the fingers. When dry, they were pressed with a steam iron. Shrinkage was measured after each laundering up to the tenth time. The swatches photographed were cut from the laundered samples.

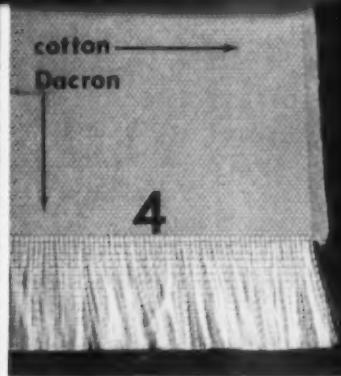
Similar samples were sent to a local dry cleaner where they were dry cleaned, pressed and measured for shrinkage ten times.

Pleated samples were laundered by the same method as those for shrinkage but were not pressed after laundering. The pleats were pressed in initially with a steam iron. Pleat retention was noted after each laundering. Fiber content, total finish, and wrinkle recovery were determined according to procedures recommended in the Yearbook of the American Association of Textile Colorists and Chemists, Vol. 31, 1955.



Fabrics containing combinations of two or more
(Lengthwise yarns are one kind of fiber and crosswise yarns)

	1. shantung	2. chambray	3. chambray
FIBER CONTENT			
lengthwise	Orlon	Orlon	nylon
crosswise	silk	cotton	cotton
WIDTH	45 inches	45 inches	45 inches
WRINKLE RECOVERY			
lengthwise wrinkle	poor	fair	fair
crosswise wrinkle	excellent	excellent	good
PLEAT RETENTION			
AFTER 5 WASHINGS	pleats durable when pressed crosswise but not when pressed lengthwise or on bias	pleats durable when pressed crosswise but not when pressed lengthwise or on bias	pleats not durable to washing
SHRINKAGE AFTER 10 WASHINGS			
lengthwise	0.3 per cent	2.0 per cent	3.3 per cent
crosswise	5.3 per cent	1.0 per cent	0.0 per cent
SHRINKAGE AFTER 10 DRYCLEANINGS			
lengthwise	0.7 per cent	2.0 per cent	1.7 per cent
crosswise	2.4 per cent	0.0 per cent	0.9 per cent
CHANGES IN FEEL AND APPEARANCE AFTER WASHING AND DRYCLEANING			
	some fraying of raw edges (see photo 1 above) water spotted when new but not after washing or drycleaning lost 4.2 per cent sizing when washed	edges frayed slightly (see photo 2 above)	raw edges frayed badly (see photo 3 above)
SUGGESTIONS FOR USE AND CARE			
	pre-shrink before use finish seams firmly (see figure 9, page 13) wash or dryclean	finish seams firmly (see figure 9, page 13) wash or dryclean	pre-shrink before use finish seams firmly (see figure 9, page 13) wash or dryclean



kinds of fibers
are another)

4. chambray

Dacron
cotton

45 inches

fair
excellent

pleats durable when
pressed crosswise
but not when pressed
lengthwise or on bias

2.6 per cent
0.0 per cent

0.6 per cent
0.0 per cent

raw edges
frayed badly
(see photo 4 above)

pre-shrink before use
finish seams firmly
(see figure 9, page 13)
wash or dryclean

Fabrics containing blends of
two or more fibers

5. tropical type suiting

56 per cent wool
44 per cent Dacron

56 inches

excellent
excellent

pleats durable when
pressed crosswise,
lengthwise or on bias

4.3 per cent
3.3 per cent

2.8 per cent
2.1 per cent

raw edges
frayed badly
(see photo 5 above)

pre-shrink before use
finish seams firmly
(see figure 9, page 13)
wash or dryclean

6. tweed

55 per cent Orion
45 per cent wool

60 inches

excellent
excellent

pleats durable when
pressed crosswise,
lengthwise or on bias

2.7 per cent
1.3 per cent

4.5 per cent
1.5 per cent

raw edges
frayed noticeably
(see photo 6 above)

pre-shrink before use
finish seams firmly
(see figure 9, page 13)
wash or dryclean

45 per cent acetate
29 per cent wool
26 per cent Orlon

7

70 per cent wool
30 per cent Dynel

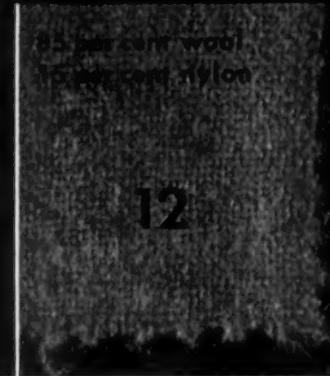
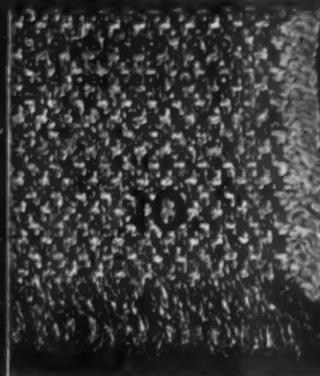
8

50 per cent rayon
50 per cent Orlon

9

Fabrics containing blends of two or more fibers: the same

	7. tweed	8. flannel	9. crepe
FIBER CONTENT	45 per cent acetate 29 per cent wool 26 per cent Orlon	70 per cent wool 30 per cent Dynel	50 per cent rayon 50 per cent Orlon
WIDTH	45 inches	60 inches	45 inches
WRINKLE RECOVERY			
lengthwise wrinkle	excellent	excellent	excellent
crosswise wrinkle	excellent	excellent	excellent
PLEAT RETENTION AFTER 5 WASHINGS	pleats durable when lengthwise but not crosswise or on bias	did not retain sharp pleats, but crease lines remained so pleats could be easily re-pressed	pleats durable when pressed crosswise, lengthwise or on bias
SHRINKAGE AFTER 10 WASHINGS			
lengthwise	5.0 per cent	4.4 per cent	5.2 per cent
crosswise	0.1 per cent	1.1 per cent	0.6 per cent
SHRINKAGE AFTER 10 DRYCLEANINGS			
lengthwise	1.9 per cent	2.8 per cent	2.0 per cent
crosswise	0.0 per cent	1.1 per cent	1.7 per cent
CHANGES IN FEEL AND APPEARANCE AFTER WASHING AND DRYCLEANING	none	fabric was crooked when purchased—could not be straightened became harsh after cleaning (cleaner was not told that the fabric contained Dynel)	edges frayed slightly
SUGGESTIONS FOR USE AND CARE	pre-shrink before use should be drycleaned	pre-shrink before use press with caution (see directions page 14) be sure to tell drycleaner about fiber content	pre-shrink before use press carefully to avoid shine (see directions page 14) wash or, preferably, dryclean



yarn (pre-blended) is used lengthwise and crosswise

10. tweed	11. tweed	12. washable* flannel
66 per cent rayon 34 per cent Orlon	80 per cent wool 20 per cent nylon	85 per cent wool 15 per cent nylon
44 inches	60 inches	54 inches
excellent fair	excellent excellent	excellent excellent
pleats durable when pressed lengthwise but not when pressed crosswise or on bias	pleats not durable to washing	pleats not durable to washing
1.77 per cent 0.55 per cent	13.0 per cent 8.3 per cent	6.3 per cent 7.1 per cent
0.55 per cent 0.11 per cent	4.9 per cent 2.0 per cent	2.7 per cent 0.0 per cent
edges frayed badly (see photo 10 above) fabric lost 15.3 per cent finish during washing and became limp	fuzzy and matted after washing	fuzzy after washing
finish seams firmly (see figure 9, page 13)	pre-shrink before use	pre-shrink before use
wash or dryclean	dryclean only, do not wash	dryclean or wash gently following directions for an all- wool fabric

*this fabric had a
special finish to
control shrinkage

Some common questions about modern fibers and fabrics

Which fibers make fabrics that are comfortable to wear if it is hot?	4
Which fibers make the warmest fabrics for winter clothing or for blankets?	4
Which fibers are likely to melt when I iron them?	5
On which fibers is it safe to use a bleach?	6
Which fibers dye most readily?	7
Are some fibers more colorfast than others?	7
Which fibers are most resistant to wrinkling?	7
Which fibers are most resistant to sunlight?	8
Do some fibers shrink or stretch more than others?	8
Which fibers are the strongest?	8
Which fibers are the weakest?	8
What can I expect from a fabric made from two or more kinds of fibers?	9
What is a "blend"?	9
What should I look for when I buy fabrics made from more than one kind of fiber?	10
Will I have any special problems when cutting, pressing, or sewing fabrics containing blends or combinations of fibers?	11-13
What should I look for when I buy garments made from fabrics containing blends or combinations of fibers?	14-15

JULY 1957



Cooperative Extension Service, New York State College of Home Economics at Cornell University and the U. S. Department of Agriculture cooperating. In furtherance of Acts of Congress May 8, June 30, 1914. M. C. Bond, Director of Extension, Ithaca, New York.